Practice: p. 580

#5 (decide which are TRUE)

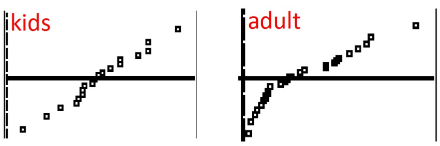
#13 (do conditions)
add (b) what does 95% conf. mean?

#28 (assume conditions met)
add the following:
(b) Type I error
(c) Type II error
(d) Power
(e) P-Value

5) only true statements are letters (c) and (e)

13) Conditions:

- 2 independent SRS	- assumed random and indep.
- $pop_1 \geq 10n_1$ $pop_2 \geq 10n_2$	- there are more than 190 types of childrens cereal and 280 types of adult cereal
- 2 normal populations or n_1 and $n_2 \geq 30$	- both normal prob. plots are roughly linear with no outliers --> normal pop's



Conditions met --> t-distribution --> 2-sample t-Interval

$$(46.8-10.154) \pm (2.017)\sqrt{\frac{6.418^2}{19}+\frac{7.612^2}{28}} = (32.494, 40.799)$$

$df=43$

We are 95% confident that the **difference** between the **average** % of sugar content in children versus adult cereals is between 32.494% and 40.799% weight.

Since the numbers are positive, we are 95% confident that the average % of sugar in childrens cereal is greater than adult cereal by 32.494% to 40.799%.

(b) 95% of all random samples of 19 kids cereals and 28 adult cereals will produce confidence intervals that catch the true **difference** between the **average** sugar content between kids and adult cereals.

OR

In repeated samples of 19 kids cereals and 28 adult cereals, the confidence intervals created will catch the true **difference** between the **average** sugar content between kids and adult cereals 95% of the time.

28) Conditions met --> t-distribution --> 2 sample t test

Ho: $\mu_H = \mu_T$
Ha: $\mu_H \neq \mu_T$

$$t = \frac{42.2-60.9}{\sqrt{\frac{16.2^2}{99}+\frac{17.9^2}{99}}} = -7.707$$

$2 \cdot P(t < -7.707 \mid df = 194) = 6.502 \times 10^{-13}$

We reject Ho b/c p-value of $6.502 \times 10^{-13} < \alpha = 0.05$. We have sufficient evidence that the **averge** liquid poured in the highball glass is not equal to that of the tumbler glass.

(b) Type I error = Concluding that the type of glass makes a difference in the amount poured, when really it did not.

(concluding that the amount poured was different between the highball and tumbler glasses, when really it was not)

(c) Type II error = Concluding that the type of glass does not make a difference in the amount poured, when really it does.

(concluding that the amount poured was not different between the highball and tumbler glasses, when really it was)

(d) Power = the probability of concluding that the type of glass makes a difference, and really it does.

(concluding that the amount poured was different between the highball and tumbler glasses, and really it was)

(e) P-Value =
There is a 6.502×10^{-11}% chance of getting a sample where the difference between the **average** amount poured is 18.7 ml or more, if there really is no difference between the **average** amount poured in each glass.

Complete Ch. 23 & 24 CW